But most of the mediævalists would scorn to entertain the idea of a Gothic dome, and declare it simply impossible and absurd. Another instance of the fallacy of precedent is here; for it may safely be contended, not only that the idea of the dome may be adopted in Gothic architecture, but that it may be better adopted therein than in the Renaissance,—and that between the pure arcuated Gothic and the pure trabeated classic, the applicability of the dome lies entirely on the side of the Gothic, and becomes an impossibility in the other,—showing at last that it is only the mongrel arcuation of the cinque-cento style which admits of the dome being used therein at all. Even such amount of pure classicism as Wilkins attained makes the dome preposterous, as all the world can see.

In the dome of St. Paul's, when looked at constructionally, the perfect trabeation of the peristyle is an inconsistency. Or, at any rate, it implies at once that the dome is no real dome at all,—no vault, but a roof of timber framing. That it ought to be a vault in pure constructional architecture is unquestionable; for what else could it be? It might be a vault covered for protection by a roof-surface of appropriate material, but a vault it must be, or it is unarchitectural. If, then, it is such a vault, arcuation becomes the principle of the structure; and the position is a perfectly safe one to assume that trabeation ought to be altogether excluded. The peristyle would then be formed in piers and arches; and here at the same time there would be better carried out that principle of verticality which is essential in the dome. In scientific arcuated architecture, if of a light character, the buttress and pinnacle become parts of the style; and there again the verticality, and also the pyramidal form of the design, are further carried out, and here is the foundation of a Gothic dome.

But let it be borne in mind that the principles now coming into play are so entirely different from those of the cinque-cento dome, that, even constructionally, the complete design would entirely differ in character, and considerably in form; so that if it were said, as it may justly be, that considerable further modification of existing details would have to be made in such an adaptation of the dome, this would only refer to still further application of the principles, chiefly in ornament, so as at last to assimilate it in outline and in detail, perfectly to the Gothic character.

It is of course not in every variety of the Gothic style that the dome could be introduced. But, to keep to our illustration of the Houses of Parliament (merely in theoretical illustration, however), it seems probable that a dome, as the roof of some great central hall, might be attempted with scarcely any violence to the design as it stands, except as regards the angle towers. A dome, surrounded by flat roofs, is an inconsistency: the roofs of this structure are beyond reproach so far. It might next be remarked, that a dome among spires is an inconsistency; but as no spire ought to be built except for a legitimate purpose, such purpose is quite a sufficient reason for dismissing the objection: if the spire have one legitimate purpose and the dome another, both are right; as in a cathedral, the spire-towers for bells and the dome for the great central vault could never be inconsistent with each other; besides which, as a dome of pointed work must necessarily become probably more pointed in general form than the present standards, the consistency would be aided even thus.

Whether a dome could properly be carried out with an open timber roof is a question, although to possess so grand a feature externally would be well worthy of an exercise of ingenuity in this direction if necessary; but as the external dome is beyond all comparison the most majestic architectural feature of its class, so the internal dome is the grandest ceiling which can be conceived,—and in Gothic detail there is no reason why such grandeur should become diminished. As no central tower would ever suffice for the dome in the exterior effect of St. Paul's, neither would it in the interior supply the place of the vaulted roof: in both respects the dome is the climax of power.

In conclusion an apology is due to the eminent architect of the New Palace of Westminster for the reference made to his celebrated work in theoretical illustration (but no more) of the position here assumed; but as there is no other building which affords a familiar illustration of the point so well, so there is no other architect who can better afford to permit such handling of his work. K.

MINERAL PRODUCTS RELATING TO THE BUILDING ARTS IN CLASS I. OF THE GREAT EXHIBITION.*

NOTWITHSTANDING the close of the Exhibition, which places it out of the power of our readers, in future, to visit for themselves one of the finest collections of mineral products ever brought together in any country, we have thought it right for several reasons to continue our notice of the building stones. We desire in this way to commemorate and place on record the state of advancement at which the industrial arts of extracting the raw materials for building have arrived in the year of the first Great Exhibition of the industry of all nations. This may form a starting point of great interest to look back upon in future years. Another object we have in view, is to show our readers where they may procure the most precise and accurate information of every kind, with reference to the building stones, by always adding the number under which each specimen is exhibited. A reference to the latest edition of the Catalogue will always show the name and address of the exhibitor, who will, of course in any case, be glad to furnish any additional information as to price, &c.

There are probably few branches of industry increasing in a greater ratio than that of quarrying minerals in this country. It appears that the profits arising from quarries in England, in 1810-11, amounted to 29,160*l.*; and in 1842-3, as determined by the assessments under the Property and Income Tax Acts, the profits amounted to 207,009*l.*, being an increase of seven times. This is a far greater increase than that which has taken place in the same period either in mining property or iron works,—the increase in the former being only four times, and in the latter something under twice.†

Yorkshire has long been celebrated for the number and variety of its building and paving sandstones, and accordingly we find the northern part of the great midland coal field, which is chiefly situate in Yorkshire, contributed more than three fourths of the specimens in this series. There was also a single specimen from the Forest of Dean, and a few from the Bristol coal field. Of Yorkshire stones we have a good selection from the neighbourhood of Leeds, Bradford, Halifax, and Sheffield, which I proceed to notice in more detail. In Nos. 160 and 183 we had specimens of Potter Newton stone from near Leeds. This is a fine-grained yellowish stone, with very minute specks of mica, and is used extensively for paving, landings, and general building purposes. No. 171 was a hard, grey coloured, fine gritstone, from Burley, near Leeds, locally termed delf stone, and much used for steps, headstones, &c. In No. 160 was a stone from Hare-hill Quarry, Gipton Wood, near Leeds. This is a very fine grit, of a light drap, approaching to cream colour, and was used in constructing the Westminster Bridewell. In the same number we had two specimens from the neighbourhood of Bradford, namely, one from Park Quarry, Shipley, and the other from Gasby Quarry. These are both fine grained, with a light brown greyish colour, and the latter is said to have been used for the principal staircase of the British Museum. From Halifax are the following specimens: No. 188, two blocks of very fine gritstone, of a whitish cream colour, from Shebden-head Quarries. This stone is interposed between the Low-moor beds of coal, and the Halifax beds, which latter immediately overlie the millstone grit. No. 172 contained a fine-grained laminated block of gritstone from Greetland, near Halifax. This is a very light drap or cream-coloured stone, and lies below any of the known beds of coal. There were also specimens in this No., in No. 160, and No. 174, from quarries at Cromwold Bottom, Southowram, and from Northowram, near Halifax. Some of these are excellent freestones, with scarcely any mica: others contain mica, are laminated, and consequently better adapted for steps and landings. The Southowram stone has been employed extensively at the Bank of England, and the paving stones generally are used all over England, besides being largely exported. The Northowram flagstone lies beneath the Low Moor coal. In No. 29, outside the building, we had a large block and steps exhibited from Green Moor Quarries, Wortley Hall, near Sheffield. This is a light brown gritstone, with traces of carbonaceous matter, and is suitable for steps, gravestones, and ornamental carving. In No. 45 were several specimens from Green Moor Quarry, grindstone rock from Wickersley, two bluish varieties, or very dark grey with very fine lamination, from Burncliffe Edge, and a brown-coloured, rather coarse-grained stone from Greenoside Quarry. No. 182 furnished a specimen of light brown gritstone from Wingerworth, near Chesterfield. No. 186 was a specimen from the Forest of Dean, a grey-coloured gritstone, which takes a very smooth and even surface when rubbed down, stands well in the most exposed situations, is well adapted for carving, and highly valued locally for architectural and engineering works. No. 193 contained a specimen from Hanham, in the Bristol coal field, being a light grey-coloured micaceous grit, much used for paving. No. 29 contained five specimens from Easton, Crews Hole, and other places in the Bristol coal field. Four of these are from the Pennant rock previously mentioned as forming the great central mass of sandstone in this coal field. These stones vary in colour from a very light grey to a darker brownish grey: some are used as freestone blocks for engine beds and other heavy machinery, and for a variety of general building purposes, while others, which are more laminated and contain vegetable remains in a carbonaceous state, are more suitable as flagstones for paving. The Pennant stones vary in weight from 158 to 171 lbs.

As many of the sandstones of the coal formation are used as flagstones in forming foot pavement, an observation on the subject of this kind of pavement may not improperly be introduced in this place. No one can have attentively observed the foot pavements of London without being struck with two things, namely, the irregularity and broken rugged character of the surface, in many places owing to the scaling off and disintegration of the stone, and secondly, the shameful manner in which the pavement is laid down. This latter evil frequently causes the largest paving stones to break entirely across, and if the mischief does not go so far as this, it is found in great irregularities of surface at the joints, where the stones ought to be perfectly flush and level with each other, instead of having differences frequently of an inch or more between one stone and another. The first of these evils arises from an inferior stone being used: the second is attributable to a defective foundation and an imperfect mode of laying down. The pavement in Trafalgar-square may be mentioned as an instance of Yorkshire flagging disintegrating and breaking up with scarcely any traffic on it; for parts of that area are little, if at all, trodden by passengers. The edges of paving stones will frequently afford an indication of their character. Those with very distinct lamination should be avoided, and so should those stones which show partings or layers of carbonaceous matter, as they are almost sure to split where such matter is interposed. A flag-stone should also be avoided if it shows any sign of opening at the edge, and if a knife point can be inserted between the layers or lamina of the stone. These tests will frequently fail to detect inferior stone, so that the quarry should be particularly examined, and all shaky beds avoided:

* See p. 670, *ante*.

† Vide McCulloch's Account of the British Empire.

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